



### I. Scope and Intent

The provisions contained herein apply to the installation of nonmetallic wiring as permitted in the National Electrical Code, and are intended to provide reasonably adequate protection at points of penetration of fire-resistive separations as defined below.

### II. Definitions

Where used herein, certain words and phrases are defined as follows:

- A. "NEC" refers to the edition of the National Electrical Code currently adopted by the City of San Diego.
- B. "Nonmetallic wiring" refers to an insulated conductor having an outer sheath of moisture-resistant, flame-retardant, nonmetallic material and includes electrical wiring, telephone cables, television cables and communication and sound system cables.
- C. "Fire-resistive separation" refers to any fire-resistive construction which is required to have protected openings such as corridor, passageway, shaft, stair enclosure and horizontal exit walls, area and occupancy separation walls, occupancy separation floors and all fire-rated floor-ceiling assemblies.
- D. "Membrane" is the sheathing or surface material used in a fire-resistive separation.
- E. "Fire stops" are tested and listed assemblies used in one of the following ways:
  - 1. Through-penetration fire stops are provided to protect:
    - a. Penetrating items passing entirely through both protective membranes of fire-resistive bearing walls and walls requiring protected openings.
    - b. Penetrations through fire-resistive floors and floors which are part of a floor-ceiling assembly.
  - 2. Membrane-penetration fire stops are provided to protect penetrating items passing through one membrane of a fire-resistive wall or through a ceiling forming the protective membrane for a fire-resistive floor-ceiling or roof-ceiling assembly.
- F. "Approved box" is an all-steel or other type electrical outlet box which is listed by Underwriters Laboratories Inc. or otherwise qualified by appropriate tests for installation in a fire-resistive separation.

### III. General Provisions

- A. Any penetration of a fire-resistive separation must be made in a manner which protects the integrity of the separation.
- B. Any electrical outlet box installed in a fire-resistive separation shall be a steel or other approved box.
- C. Any electrical outlet box installed in the perimeter wall or ceiling of an apartment unit shall be a steel or other approved box.
- D. Any electrical outlet box installed in a wall or ceiling of a public hall, corridor, passageway, etc., shall be a steel or other approved box.

### IV. Wall and Partition Penetrations

- A. Through-penetrations passing entirely through both membranes of fire-resistive bearing walls and walls requiring protected openings are permitted, provided such openings are protected with approved through-penetration fire stops suitable for the method of penetration.

Through-penetration fire stops required by the UBC must have an F or T rating determined in accordance with UBC Standard No. 7-5. The F rating applies to all through penetrations and must be at least equivalent to the fire-resistive rating of the wall penetrated. The T rating applies when penetrations through a fire-resistive wall requiring protected openings are located in a corridor wall above a ceiling which is not a part of a fire-resistive assembly or below *any* ceiling.

Penetrations no larger than a 4-inch nominal pipe or 16 square inches in cross-sectional area containing noncombustible penetrating items are also permitted. The annular space must be filled with a material preventing the passage of flames and hot gases per Section 709.6, Exceptions.

- B. Membrane penetrations for steel or other approved electrical outlet boxes not exceeding 16 square inches in area are permitted, provided the area of such openings does not aggregate more than 100 square inches for any 100 square feet of wall or partition area. Outlet boxes on opposite sides of walls or partitions must be separated by a horizontal distance of at least 24 inches.

Membrane penetrations no larger than a 4-inch nominal pipe or 16 square inches in cross-sectional area containing noncombustible penetrating items are also permitted. The annular space must be filled with a material preventing the passage of flames and hot gases per Section 709.7, Exception.

Where wall-protective membranes are penetrated by other materials or where larger openings are required than permitted above, the penetrating items shall be either:

1. Protected with approved membrane penetration fire stops suitable for the method of penetration, or
  2. Installed in accordance with the installation instructions of their listing for such use.
- C. Where conduit is used for the protection of wiring penetrations, conduit ends as well as the opening around the conduit must be filled with a material preventing the passage of flame and hot gases per Sections 709.6 and 709.7, Exceptions.
- D. Where conduit is used for the protection of wiring penetrations, the conduit fill tables of the NEC shall apply based on the number and size of the conductors contained in the cable.

#### V. Ceiling Membrane Penetrations

- A. When a ceiling forms the protective membrane for a fire-resistive floor-ceiling or roof-ceiling assembly, penetrations for noncombustible sprinkler pipe and for steel or other approved electrical outlet boxes not

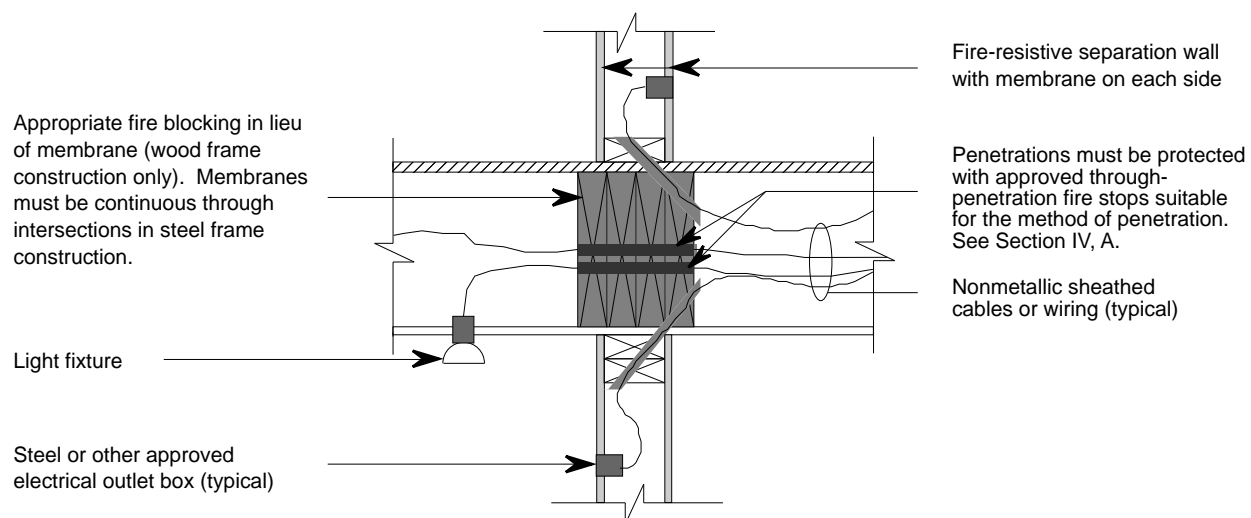
greater than 16 square inches in area are permitted, provided the aggregate area of such openings is not more than 100 square inches for any 100 square feet of ceiling area.

- B. Other penetrations are permitted where such penetrations and the assemblies in which they are utilized are tested in accordance with UBC Standard No.7-1.

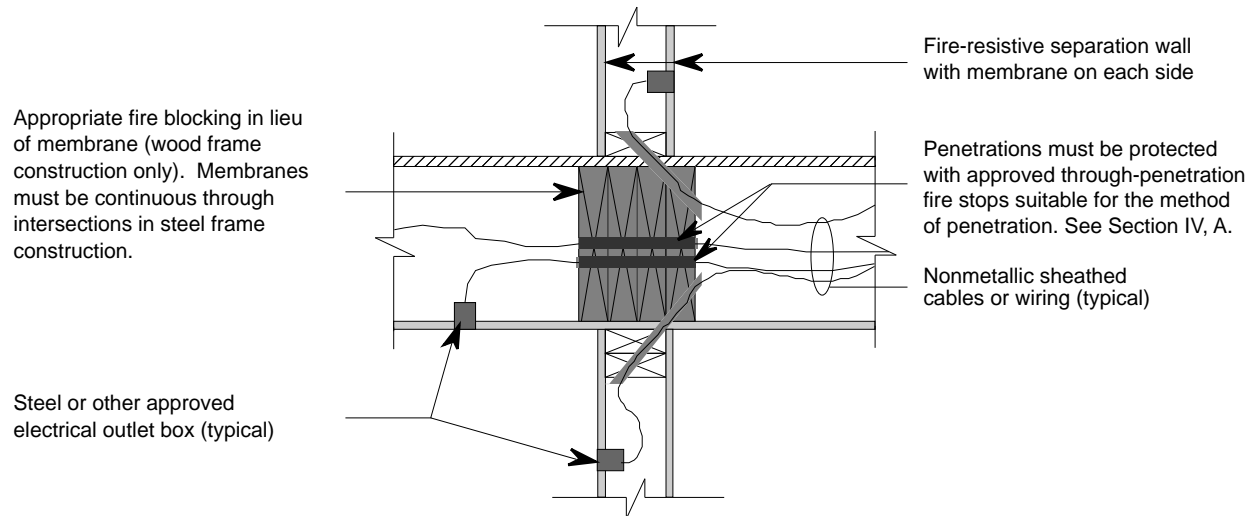
#### VI. Floor Penetrations

- A. Penetrations of fire-resistive floors and floors which are part of a floor-ceiling assembly are permitted, provided such openings are protected with approved through-penetration fire stops suitable for the method of penetration and providing an F or T rating in accordance with Section 702. The T rating shall apply only to:
1. Penetrations which are not contained within a wall at the point where they penetrate the floor, or
  2. Penetrations which are larger than a 4-inch nominal pipe or 16 square inches in cross-sectional area.
- B. Penetrations no larger than a 4-inch nominal pipe or 16 square inches in cross-sectional area containing noncombustible penetrating items are also permitted where the annular space between the penetrating items and the floor assembly is filled with a material preventing the passage of flames and hot gases per Section 709.6, Exception 1.

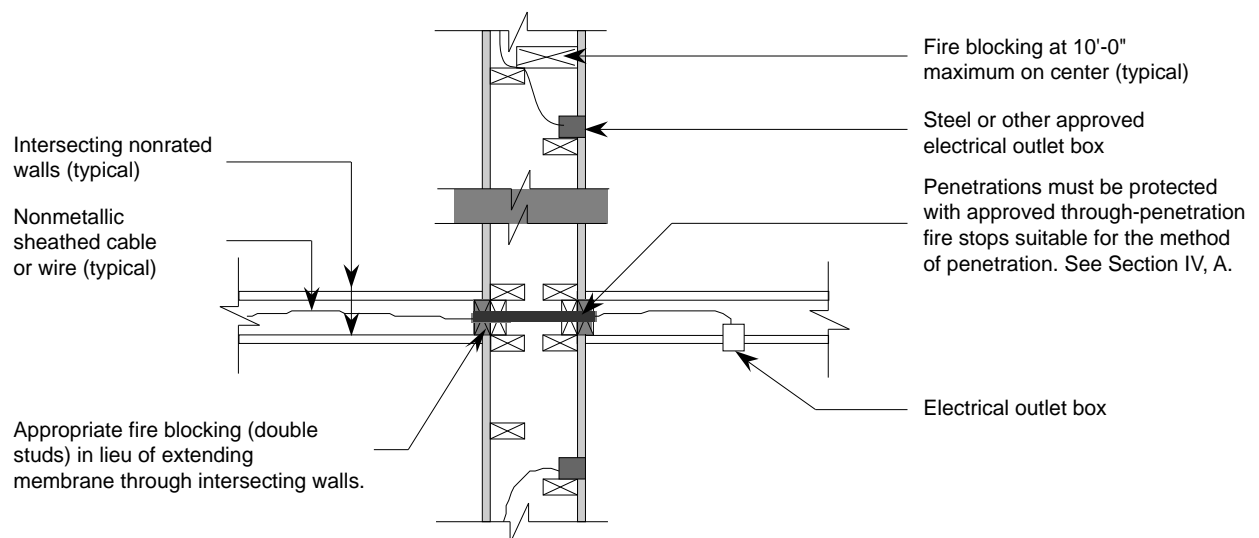
**Figure 1:** Wood or steel frame one- or two-hour fire-resistive separation wall at intersection with nonrated floor-ceiling assembly (cross-section)



**Figure 2:** Wood or steel frame one- or two-hour fire-resistive separation wall at intersection with rated floor-ceiling assembly

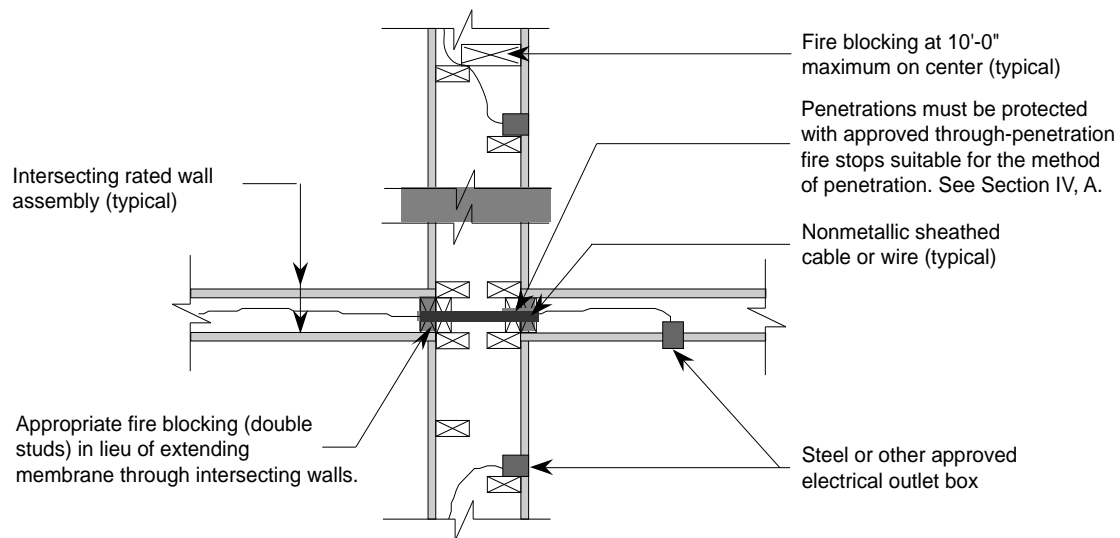


**Figure 3:** Wood or steel frame one- or two-hour fire-resistive separation wall at intersection with nonrated walls (plan view)



**Note:** This type of installation may be used in steel frame separation walls, however, for steel frame construction membranes must be continuous through intersecting walls.

**Figure 4:** Wood or steel frame one- or two-hour fire-resistive separation wall at intersection with rated wall assemblies (plan view)



**Note:** This type of installation may be used in steel frame separation walls, however, for steel frame construction membranes must be continuous through intersecting walls.